

TUBE COOLED COMBUSTOR

ABSTRACT OF THE DISCLOSURE

5 An innovative cooling tube assembly is disclosed for use in cooling the
liner of a combustor in a gas turbine engine. Each cooling tube has a
serpentine shape that conforms to the contour of the liner as the tube extends
from one end of the combustor to the other to conduct cooling air in a
counterflow direction to the exhaust gases. The cooling air gains heat, thereby
10 cooling the liner wall, and is delivered in the proximity of the burners where its
heat aids in combustion. An assembly of cooling tubes is provided for mounting
on either the cool side or the hot side of the combustor liner, the assembly
comprising a plurality of nested cooling tubes. The cooling tubes may be
fabricated of a metallic material and either brazed to the liner or supported by
15 pins inserted through the liner. The cooling tubes may also be fabricated of a
CMC material by an innovative method in which an expendable mandrel of the
desired cooling tube shape is inserted into one or more sleeves of a woven
tubular fabric bound to a fabric shell formed in the shape of the combustor liner
and densified in a furnace.